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APPLICATION FOR LETTERS PATENT

System And Method For Determining And Tracking Performance Metrics For Individual Investors

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TECHNICAL FIELD

This invention relates to Internet-based systems and methods for maintaining and tracking financial investment portfolios. More particularly, this invention relates to systems and methods for deriving and maintaining performance metrics on an individual investor's portfolio.

BACKGROUND

There are approximately 8,000 professionally managed mutual funds in operation in the United States, and the number grows annually. Each year, approximately 80% of these funds fail to outperform the benchmark S&P 500 Index. The unsatisfactory performance of most mutual funds has spawned an entire class of Index Funds (i.e., funds that track various equity indexes, such as the S&P 500, the NASDAQ 100, the Russell 2000, etc.) as well as encouraged many investors to strike out on their own and manage their accounts rather than buy mutual funds.

The financial news media highlights the fund managers who have beaten the market over various lengths of time. Unfortunately, as the above statistic reveals, the number of fund managers who actually achieve this goal is small. Moreover, these star performers are drawn from a small field of professional fund managers who typically work for fund companies and earn a living investing client monies. There is no current way to identify superstar investors from the entire universe of all investors, including those who invest for themselves only.

In recent years, increasing numbers of investors are taking direct control of their personal investments. One reason for this trend is that technology advances make it easy for investors to manage their own accounts, often making it more

convenient and less expensive than relying on financial intermediaries. With online investing, investors are afforded the flexibility to invest at times and in places that are convenient for them. In addition, the Internet offers instant access to research and financial information, such as real-time stock quotes, company financial information, investment advice, analysts' research, earnings estimates, and the like.

Due to these advances, individual investors have become increasingly sophisticated and knowledgeable about investing, dramatically narrowing the gap between resources available to the individual investor and the institutional investor. As investors obtain even greater access to these resources, they will desire even greater control over their financial decisions and seek alternative ways to invest more successfully.

One question on every investor's mind is, "How am I doing?" Is my portfolio outperforming or under performing the market or some other benchmark? For non-professional investors, this question is hard to answer because their pattern of investing is irregular. If an investor buys only one stock and holds it, the success of the investment is easily determined by simply comparing the current value of the stock to the amount the investor initially invested. However, determining success and failure of investment ideas become far more complicated when an investor has multiple stocks in a portfolio and buys and sells shares at different times for different prices. Performance gets even harder to measure if the investor occasionally invests additional cash or takes money out of the portfolio because adding or withdrawing cash from the portfolio increases or decreases its value, but not its performance.

Current typical methods of determining return on investment assume either a single investment with a regular stream of payouts, or a schedule of uniform investments over time. Any stream of investments and payouts that is not constant yields misleading performance results.

The performance of professionally managed mutual funds is graded according to a metric known as "Net Asset Value" (NAV). Net asset value takes into account cash inflows and outflows that occur on an irregular and often unpredictable basis. NAV is a widely accepted metric and is regarded as the most accurate way to measure investment performance.

Unfortunately, there is currently no way for individual investors to apply this metric to their own portfolios. There is currently no way for investors to see the whole investment picture, to measure their own success, and to measure their own performance with other similarly situated investors.

Accordingly, there is a need for a way to objectively measure the performance of an individual investor's portfolio over time in spite of all the changes an investor makes to his/her portfolio.

SUMMARY

An investment services architecture provides a full suite of investment management tools and services to investors via the Internet. The architecture includes an investment services hosting site that offers investment services to investors who access the services via the Internet using various investor computing devices. As part of the offering, the investment services hosting site allows individual investors to create virtual or real portfolios and manage them.

The investment services hosting site further provides tools that enable investors to analyze their portfolios and various investments.

The investment services hosting site has a portfolio analyzer that monitors performance of the individual investor's portfolios. In particular, the portfolio analyzer tracks a performance metric referred to as "investor's total account value" or "iTAV", which is an objective measure of performance over time despite changes the investor makes to his/her portfolio.

To measure investor's total account value, the portfolio analyzer initially assigns an arbitrary number of portfolio shares to an individual investor's portfolio (perhaps upon creation of the portfolio). Over time, certain portfolio events—cash deposits, cash withdrawals, stock splits, dividends, mergers, divestures, etc.—change the value of the investor's portfolio without affecting performance of the investor's portfolio. In response to such events, the portfolio analyzer adjusts the number of portfolio shares.

Investor's total account value is derived by dividing the total value of the investor's portfolio by the current number of portfolio shares. Adjusting the number of shares for portfolio events permits maintenance of a constant iTAV through the event, so that the event does not affect performance even though the value of the account has changed.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an investment services architecture having an investment services hosting site that offers investment tools and services to investors via a network, such as the Internet.

Fig. 2 is a block diagram of an exemplary computer that may be used in the investment services architecture.

Fig. 3 illustrates an exemplary set of data records that maintain an investor's portfolio and the performance metric associated with the portfolio.

Fig. 4 is a flow diagram of a process for determining an investor's total account value.

DETAILED DESCRIPTION

An investment services architecture provides a full suite of investment management tools and services to investors via the Internet. Among the many offerings, the investment services system offers and manages performance-based investment competitions based on model investment portfolios, allows individual investors to create virtual or real portfolios and manage them, and provide tools that enable investors to analyze their portfolios and various investments.

Through these offerings, the investment services system attempts to attract and identify the best investors in a potentially huge universe of investors. Once identified, the investment services system can create and operate actual portfolios based on the trades made by these best individual investors, essentially empowering these non-professional investors as fund managers. In the end, the financial services system offers all participating investors the tools and services to operate as an investment fund supermarket.

To identify the best investors, the investment services system monitors the performances of all participating investors. The performance must be measured using a non-biased metric that accounts for irregular investment patterns (e.g.,

non-uniform deposits and withdrawals), as well as common investing events such as stock splits, dividends, mergers, acquisitions, divestiture, and the like.

The following disclosure describes a unique performance metric that is specially designed for individual investors. It is called the "investor's total account value", or "iTAV". It is measured on a per share basis, and can be used to monitor each investor's performance. Additionally, the investor's total account value can be the basis by which investors are compared to one another to identify the best investors in the large universe of investors. It's the metric that enables individual investors to answer the question, "How am I doing?"

Internet-Based Financial Services System

Fig. 1 shows an exemplary investment services architecture 100 that allows investors to access financial investment services via a network 102, such as the Internet. While the architecture 100 can be implemented using other networks (e.g., a wide area network) and should not be limited to the Internet, the investment services architecture 100 will be described in the context of the Internet as one suitable network architecture.

The investment services architecture 100 has an investment services hosting site 104 that forms a Web site on the Internet 102. The investment services hosting site 104 provides investment services to investors who access the services via the Internet using various types of investor devices 106(1), 106(2), 106(3), ..., 106(N).

The investment services hosting site 104 has a Web server 110, a services provider 112, and an investor portfolio database 114. The Web server 110 handles multiple requests from the investor devices 106(1)-106(N) and serves Web pages

120 containing financial and investment information to the requesting investors. The Web server 110 may be implemented as one or more computers that are configured with server software to host a site on the Internet 102.

The Web server 110 implements dynamic server technologies that generate and serve dynamic Web pages 120 tailored to individual investors. Unlike static Web pages that are pre-constructed and served from storage, dynamic Web pages are generated on-the-fly in response to individual requests from investor devices 106. In this manner, the Web server 110 can craft pages using investor-specific information obtained from the request, the services provider 112, and/or the portfolio database 114.

It is noted that the investment services hosting site 104 may be configured to transmit information in data formats other than HTML (hypertext markup language) pages. As one example, the site 104 may be configured with a transmitter (not shown) to transmit information to wireless investor devices with limited screen sizes. Thus, the Web pages are merely shown for explanatory purposes, as other data formats and transmission protocols may be used.

The services provider 112 is a backend computing system comprised of one or more computers that are configured to support the investment-related computing tasks. For a passive visitor to the Web site, the services provider 112 may offer introductory information on investing, as well as general advice and market data. The mix of services is designed to attract the passive visitor and convert him/her to an active participant at the site.

For active participants, the services provider 112 allows investors to create and manage portfolios, which are kept in portfolio database 114. The portfolios may be real portfolios that reflect investors' true holdings, or virtual portfolios that

do not correlate to invested money but are used for tracking stocks or for competition purposes.

The service provider 112 offers a set of tools 130 to assist the investors in analyzing their portfolios and individual investment opportunities, such as stocks or bonds. As examples, the tools 130 might include portfolio-centric tools for identifying outperforming and underperforming investments in a portfolio and determining the volatility of an investor's portfolio over various time periods (e.g., 3 months, 6 months, 9 months, 12 months, and 24 months). The tools 130 may further include investment-centric tools such as market timing analysis that examines how well specific purchases and sales of individual investments have played out over time as well as sales and earnings growth analysis for individual equities.

The services provider 112 includes a portfolio analyzer 132 that maintains investor portfolios and tracks their performance. The portfolio analyzer 132 monitors account activities—trades, withdrawals, deposits, dividends, stock splits, etc.—and updates the portfolios in the portfolio database accordingly. The portfolio analyzer 132 receives investment and market information from one or more various market sources (not shown) to maintain current up-to-date information. The portfolio analyzer 132 may also be configured to download actual portfolio data from brokerages that perform the actual trading for the investors.

The portfolio analyzer 132 has an iTAV module 134 that computes the investor's total account value. In particular, the iTAV module 134 computes the following:

iTAV = Current Value of Investor's Account /Number of Portfolio Shares

The number of shares in the denominator is initially an arbitrary number assigned to the account. The number of shares is modified upon certain events that affect the account, such as cash withdrawals, cash deposits, cash dividends, stock splits, mergers, divestitures, and the like.

As a simple example, suppose the current value of the investor's account is $25,000 and that the investor had 10,000 shares. This would yield an iTAV of $2.5/share (i.e., 25,000/10,000 = 2.5). Next, suppose that over time the total value of the investor's account increased to $30,000. The new iTAV would be $3/share (i.e., 30,000/10,000 = 3.0). Performance over this time frame can be determined as the percentage gain from $2.5/share to $3/share, or a 20% gain.

The investor's total account value is an objective, reliable measure of how well an individual's personal portfolio is performing over time, as well as in comparison to the market, other investors, or other benchmarks. Total account value enables investors to measure and compare the success of their ideas as investments.

The portfolio analyzer 132 stores an iTAV for each investor in the investor portfolio database 114 in association with the investor. The portfolio analyzer 132 updates this metric periodically, such as once per day or more frequently.

The services provider 112 may further include a ranking module 136 that ranks individual investors based on their iTAV. The ranking module 136 occasionally sorts data records kept in the investor portfolio database 114 to identify those investors who are outperforming their peers. The ranking process may be executed over the entire universe of investors, or segmented according to

investment strategies (e.g., value, growth, etc.), sectors (e.g., technology, biotechnology, cyclicals, drugs, etc.), equity types (e.g., small cap, mid-cap, large cap), clubs, teams, leagues, geographic locations (e.g., all investors in Nebraska), age groups, gender, and the like.

Exemplary Computer

Fig. 2 shows an exemplary computing device 200 that may be used to implement an investor device 102 or one or more computers at the investment services hosting site. The computer system 200 can be configured, for example, as a server computer, a database computer, an investor computing device, or a computing device that implements the network. The computer system 200 can be used to host investment services functions such as serving or rendering a web page containing information regarding investment services, enabling investors to establish and manage portfolios, monitoring performance of the investors account, and ranking investors to identify the best investors.

Computer 200 includes at least one processor 202 and memory 204 coupled to a bus 206. Bus 206 represents one or more of many different bus structures, such as a memory bus or memory controller, a peripheral bus, and a processor or local bus using any of a variety of bus architectures and protocols. Memory 204 might include volatile memory 210 (e.g., RAM) and non-volatile memory 212 (e.g., ROM, Flash, hard disk, RAID system, etc.) to provide for non-volatile storage of data (e.g., computer-readable instructions, data structures, program modules and other data used by computer 200). Memory 204 might further include a removable storage device 214 to accommodate removable storage media (e.g., floppy disk, PCMCIA cards, tape, CD-ROM, etc.). It will be appreciated

that other types of computer-readable media which can store data that is accessible by a computer, such as flash memory cards, digital video disks, and the like, may also be used in the exemplary computer.

A network interface 220 is coupled to bus 206 to provide an interface to a data communication network, such as a local area network (LAN), a wide area network (WAN), or the Internet, for exchanging data with other computers and devices.

A peripheral interface 222 is coupled to bus 206 to provide an interface for individual peripheral devices. Exemplary peripheral devices include one or more input devices 230 (e.g., keyboard, keypad, touch pad, mouse, trackball, microphone, joystick, video camera, etc.) and a display 232 (e.g., monitor, LCD, TV, etc.). Other possible peripheral devices, which are not depicted, include a network interface (e.g., modem, satellite receiver, RF transceiver, network card, etc.) and one or more non-display output device(s) (e.g., printer, speakers, scanner, etc.).

A variety of program modules can be stored in memory 204, including an operating system, a server system, one or more application programs (e.g., portfolio analysis program), and other program modules and program data. In a networked environment, some or all of the program modules executed by computer 200 may be retrieved from another computing device coupled to the network.

Typically, the computer 200 is programmed using instructions stored at different times in the various computer-readable media of the computer. Programs and operating systems are often distributed, for example, on floppy disks or CD-ROMs. The programs are installed from the distribution media into a storage

device within the computer 200. When a program is executed, the program is at least partially loaded into the computer's primary electronic memory. These and other types of computer-readable media contain instructions or programs for implementing the group buying processes described below.

Computer system 200 is exemplary only – additional components may be included in system 200 and/or some components may not be included in system 200. By way of example, system 200 may include co-processors that operate in conjunction with processor 202. By way of another example, a wireless computing device may include a wireless transceiver, but not include removable storage 214.

iTAV Data Records

Fig. 3 shows one exemplary set of investor data records 300 that may be used to store iTAV metric in association with each investor and update the iTAV metric as needed. In this example, the database is configured as a relational database in which data records are organized in tables that may be associated with one another using definable relationships.

In the illustrated implementation, the investor data is organized in an investor table 302, a portfolio table 304, a cash table 306, and a portfolio shares table 308. The investor table 302 maintains an investor ID field 320 to hold identification information of each individual investor (e.g., name, address, email, phone, account numbers, etc.) and an iTAV field 322 to hold the investor's associated iTAV metric. Data records in the investor table 302 are correlated with corresponding records in portfolio table 304, cash table 306, and portfolio shares

table 308 via relationships, such as those relationships illustrated as lines 310 linking records for "Investor 456" with other records.

The portfolio table 304 lists one or more investments of the investor in a real or virtual portfolio account. The portfolio table 304 might includes stocks, bonds, options, and other investment vehicles. In this example, the portfolio table 304 contains an account ID field to hold the portfolio account ID, a stock field to hold identities of individual stocks, a current price field to list the price of the stock, a share field to hold the number of shares owned of each stock, and current value for each individual stock holding. The portfolio table 304 also holds a total value of all non-cash investments (e.g., $1,245,350).

The cash table 306 maintains any cash balance for the investor. Here, the investor currently holds $23,000 in cash.

The portfolio shares table 308 holds the number of portfolio shares currently associated with an investors account. Initially, each account is assigned an arbitrary number of shares. For a virtual portfolio with an original total value of $1,000,000, the portfolio analyzer might assign 100,000 shares to establish an initial iTAV of $10/share. Over time, the number of shares change upon occurrence of certain events, such as cash withdrawals, cash deposits, cash dividends, stock splits, mergers, divestitures, and the like.

The portfolio analyzer 132 resides on the services provider 112 (Fig. 1) and makes queries to the portfolio database 114. Suppose the portfolio analyzer is interested in investor 456, as indicated by the query for "InvID456". The queried record indicates that the investor has an investor total account value of $12.6835/share.

The iTAV module 134 derives this metric by adding the total non-cash value from portfolio table 304 (i.e., $1,245,350) and the cash value from cash table 306 (i.e., $23,000) to yield $1,268,350 and dividing that value by the number of portfolio shares obtained from shares table 308 (i.e., 100,000) to produce $12.6835/share. Each time the iTAV is computed, it is stored in the investor table 302 to keep the metric current.

iTAV Derivation Process

Fig. 4 shows a process 400 of determining an investor's total account value. The process 400 may be implemented by the investment services hosting site 104, and particularly the services provider 112 and portfolio database 114. The process 400 may be implemented in software as computer executable instructions that, when executed, perform the operations illustrated as blocks in Fig. 4.

At block 402, the portfolio analyzer 132 updates the investor portfolios with the recent prices and other market information. Depending upon implementation factors, the updating operation may be performed occasionally (e.g., once per day), periodically (e.g., every 15 minutes or each hour), or continually (e.g., using real-time data to update the portfolio data). At block 404, the portfolio analyzer evaluates whether any portfolio events have occurred. Portfolio events are non-price-movement events that affect the portfolio. Examples of possible events include stock splits, dividends, cash withdrawals, deposits, mergers, acquisitions, divestitures, and so forth.

If any such events have occurred (i.e., the "yes" branch from block 404), the portfolio analyzer adjusts the number of portfolio shares to compensate for the event (block 406). For example, if the investor deposits additional money, the

portfolio analyzer might increase the number of shares according to the current iTAV. Examples of specific portfolio events are examined below in more detail under the heading "Portfolio Events".

After adjustment, or if no portfolio events have occurred (i.e., the "no" branch from block 404), the portfolio analyzer 132 determines the current value of the individual investor's account (block 408). The analyzer 132 queries the portfolio database 114 for the total non-cash value from the portfolio table 304 and the cash value from the cash table 306 and sums the two results. Using the example of Fig. 3, the current value of the individual investor's account is $1,268,350 (i.e., $1,245,350 + $23,000).

At block 410, the portfolio analyzer 132 (or iTAV module 134) determines the investor's total account value (iTAV). The portfolio analyzer 132 queries the database for the number of portfolio shares from the shares table 308, and passes the result along with the total account value to the iTAV module 134. The iTAV module 134 computes the iTAV metric by dividing the total account value by the number of shares. In our example, this computation yields $12.6835/share (i.e., $1,268,350/100,000 shares).

At block 412, the portfolio analyzer 132 stores the newly derived iTAV in the investor table in association with the investor. The process 400 can then be repeated for every investor in the database.

Portfolio Events

The following provides example scenarios of portfolio events that may arise and how the portfolio and shares are adjusted to account for these events, thereby enabling iTAV to be an objective measure of performance over time in

spite of changes to the portfolio. The following scenarios are not exhaustive, but merely instructional to point out how the operations in blocks 404 and 406 of Fig. 4 might be carried out. Each scenario assumes that the investor's account currently exists as shown in Fig. 3.

Cash Deposit

One portfolio event that affects the iTAV parameters is when the investor makes a cash deposit. Suppose the investor deposits $20,000 into the account, raising the cash balance from $23,000 to $43,000. In response to this event, the number of portfolio shares is adjusted to ensure that the iTAV metric remains the same before and after the event. Otherwise, if the number of portfolio shares were kept constant and not adjusted, the investor's performance would suddenly dramatically improve from $12.6835/share to $12.8835/share, even though there was no such improvement.

Accordingly, in response to the deposit event, the iTAV module 134 increases the number of shares to keep the iTAV constant. In this case, the number of shares is increased by approximately 1,576.852 shares from 100,000 to 101,576.852. The increase number is obtained by dividing the new deposit of $20,000 by the current iTAV of $12.6835/share, to yield 1,576.852 shares. The portfolio analyzer 132 stores the new portfolio share number 101,576.852 in the share table 308.

Now, when the iTAV is computed, it is the same after the deposit. More particularly, the iTAV would be $1,288,350 (i.e., total account value of $1,245,350 plus $43,000) divided by the new share number 101,576.852 to yield $12.6835/share.

Cash Withdrawals

Cash withdrawals are similar to cash deposits, only the number of portfolio shares is decreased to account for the withdrawals. For example, suppose the investor withdraws the entire cash balance of $23,000. In response to this withdrawal event, the iTAV module 134 decreases the number of shares to keep the iTAV constant. In this case, the number of shares is decreased by approximately 1,813.380 shares from 100,000 to 98,186.620. The decrease number is obtained by dividing the withdrawal amount of $23,000 by the current iTAV of $12.6835/share, to yield 1,813.380 shares. The portfolio analyzer 132 stores the new portfolio share number 98,186.620 in the share table 308. Accounting for the withdrawal, the iTAV module updates iTAV by dividing the $1,245,350 in the portfolio table 304 by the new share number 98,186.620 to yield the same iTAV of $12.6835/share.

Stock Split

In the implementation described herein, a stock split is a portfolio event that has no impact on the number of portfolio shares, and hence there is no adjustment in operation 406. Suppose that stock 2 in portfolio table 304 undergoes a two-for-one stock split, producing a post-split price of $55 and an increase of shares to 300. The new parameters still produce the same total amount of $16,500, which is part of the total non-cash parameter. Since this later amount does not change, the number of shares needs not change.

Dividend

A cash dividend is a portfolio event that has a similar effect as a cash deposit (assuming the dividend is not part of an automatic reinvestment program). When a company pays a stock dividend, the amount is deposited into the cash account. To compensate for this added cash, the iTAV module 134 increases the number of portfolio shares to an amount that maintains a constant iTAV.

Conclusion

Although the description above uses language that is specific to structural features and/or methodological acts, it is to be understood that the invention defined in the appended claims is not limited to the specific features or acts described. Rather, the specific features and acts are disclosed as exemplary forms of implementing the invention.